

# Strategy 1

## Brainstorming and Discussion



### WHAT: DEFINING THE STRATEGY

The brain is a highly social organism. If you don't believe that statement, just arrive early at a faculty meeting or any other type of social gathering, particularly one where people know one another. Watch what happens as people begin to arrive. Most of them take the opportunity to converse with one another. Very few, if any, sit in silence.

Then visit a traditional classroom where students spend most of their time engaged in individual activity without the benefit of conversation and, in fact, are expected to sit in silence for a greater period of the day. What is wrong with this picture? Perhaps teachers are expecting students to exhibit behavior that is unnatural to the brain. You see, discussion has many advantages, not the least of which is that simply opening the mouth to speak sends oxygen to the brain and facilitates dendritic growth.

When students are given the opportunity to brainstorm ideas without criticism, to discuss opinions, to debate controversial issues, and to answer questions at all levels of Bloom's taxonomy, wonderful things can happen that naturally improve comprehension and higher order thinking.



### HOW: SAMPLE CLASSROOM ACTIVITIES

- Level/Subject Area: Elementary/Middle/High (Cross-curricular)

Standard/Objective:

Encourage divergent thinking.

Activity:

Students are given a question to which there is more than one appropriate answer. Students brainstorm as many ideas as





### WHY: RESEARCH RATIONALE

Students learn 90% of what they say or discuss as they complete an activity. (Dale, 1969)

Learner performance scores improved when learners were asked questions of greater depth. (Redfield & Rousseau, 1981)

Better quality questions result in more challenge to the thought processes of the brain. (Berliner, 1984)

Learning increases when students have the opportunity to talk about it in their own words; to make it their own. (U.S. Department of Education, 1986)

Students who discuss how they and others think become better learners. (Astington, 1998)

Regardless of the topic or task, small-group discussion reinforces classroom learning, assists the brain in recalling the information, and allows students to solve problems collaboratively and explore topics in depth. (Alexopoulou & Driver, 1996)

The ability to ask questions allows individuals to be creative, to imagine beyond what is given, to search for missing information, physical rationales, and human purposes that will explain the given. (Harpaz & Lefstein, 2000)

It is unrealistic for teachers to formulate questions for students since, in real life, students are required to form their own questions. (Sternberg & Grigorenko, 2000)

When students generate their own questions, they become actively engaged in reading and motivated by their own queries rather than those of the teacher. (Report of the National Reading Panel, 2000)

The process of brainstorming can be used to activate prior knowledge since one student's idea causes other students to scan their neural networks for related ideas. (Gregory & Chapman, 2002)

possible in a designated time period  
using the DOVE guidelines:

Defer judgment, One idea at a  
time, Variety of ideas, and Energy  
on task.

- Level/Subject Area: Elementary/Middle/High (Cross-curricular)

Standard/Objective:

Increase higher order thinking skills.

Activity: Students answer content-related questions at all levels of Bloom's taxonomy using the question stems provided below. Include all levels of questioning in discussion groups as well as on teacher-made tests.

- Level/Subject Area: Elementary/Middle/High (Language Arts/History)

Standard/Objective: Increase higher order thinking skills.

Activity: Students discuss how they would react if they found themselves in the same situation as a literary character or a historical figure. Example: What would you have done if you found yourself alone in the wilderness for an extended period of time, as Brian did in the story *Hatchet*, by Gary Paulsen?

- Level/Subject Area: Elementary/Middle/High (Mathematics)

Standard/Objective: Solve a math problem.

Activity: Students are given a math problem to solve. Ask each student in a group to describe how a solution was reached. When all have finished, students' varying paths to the answer are compared and discussed, allowing them to see that there may be more than one way to solve a problem.

- Level/Subject Area: Elementary (Science/Mathematics)

Standard/Objective: Comprehend the term *ratio*.

Activity: Show the class a can of frozen juice and ask students if they have ever mixed juice using a concentrate. Ask them to explain the procedure of blending three cans of water to one can of concentrate (a ratio of three parts water to one part concentrate). Students then brainstorm additional examples of ratios from their own experiences.

- Level/Subject Area: Elementary/Middle/High (Cross-curricular)

Standard/Objective: Read a variety of texts.

Activity: Students form interest groups and each group selects and reads a text or book of interest. Students then meet to discuss the text by asking questions of one another, making connections, and challenging one another's opinions.

- Level/Subject Area: Elementary/Middle/High (Cross-curricular)

Standard/Objective: Read a variety of texts.

Activity: Students peruse books, magazines, newspapers, or the Internet to find information that is of interest to them. Students focus on the pertinent points, ask questions, and provide their personal insights on the information. They then present a summary of the information to the class. Classmates ask original questions using the question stems provided below.

### Model Questions and Key Words to Use in Developing Questions

#### I. Knowledge (eliciting factual answers, testing recall and recognition)

|                   |                      |
|-------------------|----------------------|
| Who               | Describe             |
| What              | Define               |
| Why               | Match                |
| When              | Select               |
| Where             | Which one            |
| How               | What is the one best |
| How much          | Choose               |
| What does it mean | Omit                 |

#### II. Comprehension (translating, interpreting, and extrapolating)

|                         |           |
|-------------------------|-----------|
| State in your own words | Summarize |
| What does this mean     | Select    |

|                           |                              |
|---------------------------|------------------------------|
| Give an example           | Outline                      |
| Condense this paragraph   | Match                        |
| State in one word         | Explain                      |
| What part doesn't fit     | Represent                    |
| What restrictions         | Demonstrate                  |
| would you add             | Which are facts, opinions    |
| What exceptions are there | Is this the same as          |
| Which is more probable    | Select the best definition   |
| What are they saying      | What would happen if         |
| What seems to be          | Explain what is happening    |
| What seems likely         | Explain what is meant        |
| Classify                  | Read the graph, table        |
| Judge                     | This represents              |
| Infer                     | Is it valid that             |
| Show                      | Which statements support the |
| Indicate                  | main idea                    |
| Tell                      | Sing this song               |
| Translate                 | Show in a graph, table       |

### III. Application (to situations that are new, unfamiliar, or have a new slant for students)

Predict what would happen if  
 Choose the best statements that apply  
 Select  
 Judge the effects  
 What would result  
 Explain  
 Identify the results of  
 Tell what would happen  
 Tell how, when, where, why  
 Tell how much change there would be

### IV. Analysis (breaking down into parts, forms)

|                              |                                    |
|------------------------------|------------------------------------|
| Distinguish                  | What statement is relevant,        |
| Identify                     | extraneous to, related to,         |
| What assumptions             | not applicable                     |
| What motive is there         | What does the author believe,      |
| What conclusions             | assume                             |
| Make a distinction           | State the point of view of         |
| What is the premise          | What ideas justify the             |
| What ideas apply, do not     | conclusion that                    |
| apply                        | The least essential statements are |
| Implicit in the statement is | What's the theme, main idea,       |
| the idea of                  | subordinate idea                   |

What is the function of  
 What's fact, opinion  
 What inconsistencies,  
 fallacies are there

What literary form is used  
 What persuasive technique  
 What is the relationship between

**V. Synthesis** (combining elements into a pattern not clearly there before)

Write (according to the  
 following limitations)  
 Create  
 Tell  
 Make  
 Do  
 Dance  
 Choose  
 How would you test  
 Propose an alternative

Solve the following  
 Plan  
 Design  
 Make up  
 Compose  
 Formulate a theory  
 How else would you  
 State a rule  
 Develop

**VI. Evaluation** (according to some set of criteria, and state reasons for your evaluations)

Appraise  
 Judge  
 Criticize  
 Defend  
 Compare

What fallacies, consistencies,  
 inconsistencies appear  
 Which is more important, moral,  
 better, logical, valid,  
 appropriate, inappropriate  
 Find the errors

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Based on Bloom's *Taxonomy, Developed and Expanded* by John Maynard, Pomona, CA. The document is copyrighted by the TESA Program, Los Angeles County Office of Education, Phone: 1-800-566-6651.